

Coal For Development — The Transition To Fusion

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The U.S. Labor Party is issuing the following program for coal development at a time when the continuation of the United Mine Workers national strike could throw the nation into an energy emergency by mid-to-late February if the cold weather continues.

It is imperative that the miners' union and the labor movement as a whole, as well as industry act at this time to settle the strike on the basis of the outlines presented below.

The only competent approach to formulating the fossil fuel component of a national energy program is to figure out how much will be required to bring the nation to the next "manifold" of energy production and use. Neither fossil fuels themselves nor uranium-based fission technology is the long-term solution to the problem of providing an increasing standard of living for the country and the world; only thermonuclear fusion offers the possibility of raising energy production, consumption, and throughput in the economy in the magnitudes required.

The central question, therefore, becomes how quickly we must exploit our fossil and particularly coal reserves to ensure the standard of living and the industrial production and infrastructure to reach and use fusion power. In order to rebuild our 50-year obsolete basic industry, raise agricultural productivity for export, and provide every worker in the United States with a skilled job, all necessary for an advanced fusion economy, energy growth will have to be on the order of 10 percent per year.

Due to the finiteness of fissile uranium and the current sabotage of the fast-breeder reactor program, coal will have to continue to provide approximately 50 percent of the nation's electricity. Current work in magnetohydrodynamic (MHD) technology using coal offers the opportunity of cutting the cost of providing electric power *in half*, with no sulfur pollution, and realizing fuel efficiencies *double* that of conventional coal-burning steam plants. The development of MHD technology is itself a prerequisite for the direct energy conversion possible with fusion.

The production of 1,000 fission reactors in the United States alone by the year 1990 will require more than 53 million tons of steel, more than half of total current depression levels of steel production. Agricultural expansion, modernizing and expansion of basic machine tool and other industry and transportation, and the rebuilding of the steel industry itself translate into a doubling of steel output within the next seven to 10 years.

This renaissance in basic industry means that coal production for steel, now less than 200 million tons per year, will have to at least double in the same time period. The two-thirds of coal production related to electric power will need to double in output every five to eight years.

Only if we reach commercial fusion by the 1990s can we afford such an ambitious exploitation program. Only if we approach energy growth rates of this magnitude can we hope to reach fusion by that time. The proper financial policy for such a plan has been identified in the Labor Party's "national bank" proposal for a hard-commodity credit system. Now, we lack only the will.

Coal for Deindustrialization

None of the past year's discussions or proposed legislation concerning coal have had anything to do with the formulation of a national energy program. Coal has been used as the leading edge of the Schlesinger deindustrialization program, and the Carter Administration's drive to bankrupt American industry through skyrocketing energy prices, counterproductive conversion to coal, and draining of sorely needed capital investment funds.

The mandatory coal conversion bill now being considered by both houses of Congress would cost industry over \$50 billion and utilities over a quarter of a billion dollars. This insane proposal, which has been attacked by the National Coal Association, the Edison Electric Institute (speaking for the utility companies), and all major industries, would require scrapping all capital investment funds for a program that will waste energy and prevent old and obsolete (and polluting) equipment from being replaced with more energy-efficient and productive technology.

The outrageous Department of Energy research and development program to develop synthetic gas and liquid fuel from coal has absolutely no economic or technological justification. These "alternate fuels" would require *quadrupling* the current cost of energy, making energy a luxury for consumers and manufacturers alike. The only justification given for such a program, which has its "roots" in the labor-intensive economies of Nazi Germany, is that it will allow us to lessen our dependence on imported oil and gas and help cut the U.S. balance of payments deficit. The U.S. Labor Party's proposed nuclear-export program will not only balance the payments, but provide millions of skilled jobs in industry, rather than killing capital and energy-intensive industry by raising the cost of energy.

Over the past year there have been a barrage of newspaper articles debating which is the lesser of two evils, coal or nuclear. "Coal may kill you slowly through pollu-

tion and the carbon dioxide 'greenhouse effect,' but nuclear energy could wipe out a whole city in one fell swoop," so the argument goes. Simply lying about the supposed dangers of nuclear power, and never mentioning the fact that most coal pollution could be eliminated through high-technology innovation, the only point to this concerted campaign has been to pit coal against the nuclear industry.

Who Believes Schlesinger?

Neither the National Coal Association nor the nuclear industry has so far fallen for this black propaganda operation, but the vulnerable United Mine Workers (UMW), terrified that nuclear development will take away jobs in the coal mines, has found itself in the untenable position of opposing nuclear energy, although historically the union was in the forefront of fighting for advanced technology both in coal and in the economy more generally.

The Institute for Policy Studies takeover of the UMW, feeding and provoking anarchist wildcat strikes and violence (see *Executive Intelligence Review*, Dec. 26, 1977, Vol. IV, No. 52), has cast doubt on the political reliability of coal as a major energy source in the future. The fact that 25 million tons of coal were lost last year due to unauthorized strikes has succeeded in creating a situation where a minority in the currently negotiating Bituminous Coal Operators Association has seemed justified in opting for busting the union to end the anarchy in the mines. In addition, American industry and utilities who have been told to convert from gas and oil to coal, or who already rely on coal for power or industrial processing, are unsure that U.S. coal can be delivered on contract.

The crowning irony of the Carter-Schlesinger "coal program" is that unreasonably restrictive environmental legislation passed in 1977 will undermine the stated goal of doubling coal production to 1.2 billion tons by 1985. The stripmining land reclamation provisions and the suspension of stripmining on prime agricultural land will seriously hamper industry efforts to develop important midwestern and far western coal reserves.

Recently passed amendments to stiffen the Clean Air Act will make it financially impossible for many utilities and industries to burn coal. Most coal producers, therefore, do not believe there will be a market for anywhere close to 1.2 billion tons by 1985, even if they could mine that much coal.

It is clear that the current Administration's coal policy has nothing to do with providing energy, and worse, is the leading excuse for raising energy costs and prices to bankrupt industry. The present stalemate in the UMW strike gives energy czar Schlesinger the added bonus of manipulating the nation's energy supplies if the strike drags on and stockpiles begin to run out. The added features of an abnormally cold winter and significant provoked violence blamed on the UMW could be enough to legitimize Schlesinger's "Winter Energy Emergency Program" for military control of energy and transport. That will simply give Mr. Schlesinger fingertip control over all industry.

A Real Program for the UMW

Coal mining is currently the most dangerous industrial occupation. Since the turn of the century, one out of every

seven miners has been killed on the job. Hundreds of thousands more have died slow deaths from black lung disease. One of the major necessary concerns of the UMW, therefore, has been for the health and safety of its members in the mines.

Under the leadership of John L. Lewis, this very real concern was linked to the notions that: (1) the level of technology in the mines themselves was the determining factor in the physical well-being of coal miners; (2) that the level of worker productivity in the mines affected the material living standard of the workers as new technology raised their skill level and command for higher wages; and (3) that coal production was critical for economic health nationally and internationally, as an energy resource that could be replaced by more economical energy technology without throwing miners onto the unemployment lines, but reemploying them in new areas of economic growth when coal was superseded.

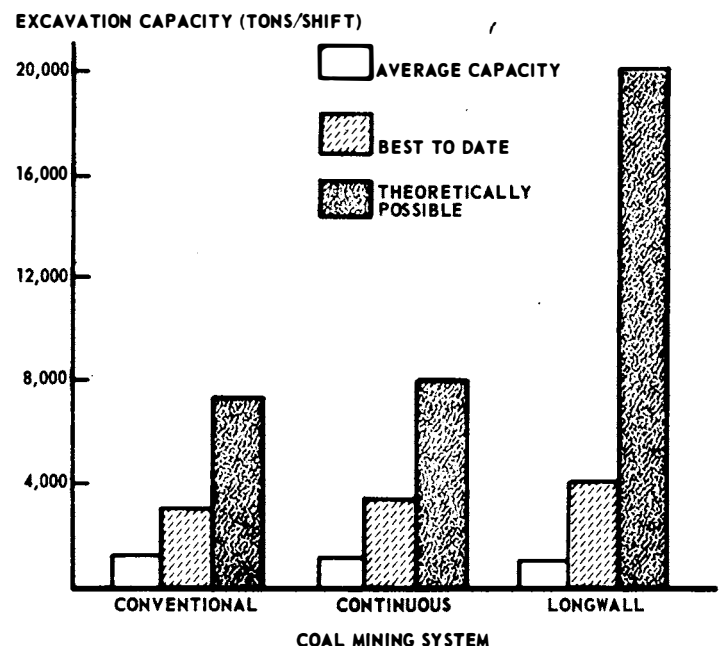
It is only by returning to such a global conception of the role of coal in the economy and the fate of the individual UMW member — as a function of the growth of the overall economy — that the UMW today will be able to both negotiate a meaningful contract in the current strike situation and be an important partner in a labor-industry alliance for development.

The technology exists today to both dramatically increase the productivity of the mineworker and protect his health and safety, instead of sending hundreds of federal OSHA inspectors into the mines to detect "dangers" in the current backward mining methods and keep mines closed until they can be patched up.

Longwall Mining

For the past 25 years, European Economic Community coal producers have used longwall mining technology for 90 percent of production, whereas in the United States

Figure 1
Relative Excavation Capacity,
By Coal Mining System



Source: U.S. General Accounting Office

this more advanced technology accounts for less than 4 percent of national output.

Longwall machinery is an integrated mining system. A single machine shears the face of the seam, carries coal out on a continuous conveyor belt, and provides steel-support for the roof of the mine. Since the miner is working with one integrated piece of machinery, he can be enclosed in an air conditioned cab, preventing inhalation of deadly coal dust. The potential of conventional longwall technology in terms of productivity is clear from *Figure 1*. In combination with more sophisticated and computerized monitoring of methane levels in the mines, cave-ins and explosions can be almost totally eliminated.

More advanced longwall technology is under experimental introduction in Poland, the world's fourth largest coal producer. There, the machinery is being completely automated through aboveground computer control. In such a system, the "miner" is a highly skilled computer technician working outside of the mine, running an extremely sophisticated machine.

The use of the most advanced mining technology is required not only for the health and safety of the miners. The General Accounting Office has estimated that in order to meet a goal of a 70 percent increase in coal production by 1985 (450 million tons), over \$45.5 billion in investment will be needed in coal production alone. This includes the opening of approximately 800 new mines, and the recruitment and training of more than half a million new miners. Using present productivity figures, this would put an enormous burden on the mining equipment manufacturers, the coal companies, and the labor force to provide the machinery and *trained* workers.

The use of longwall technology in the additional mines could cut the number of needed systems at least in half, decrease the number but upgrade the skill level of the *new* miners required, and begin to bring the industry as a whole into the modern era. The absolute amount of money needed as capital investment to expand production would probably not be greatly affected. Such dramatic increases in productivity in the mines and in standards of living for miners is the only possible way to meet our national coal production goals.

Cutting The Cost of Electricity: MHD

All of the utilities, manufacturers and consumers who have been wondering how they will survive increased electricity costs due to coal conversion, rising natural gas prices, and multitudes of energy taxes should consider the following.

Current coal-burning plants, which produce approximately 45 percent of our electricity (and use two-thirds of our coal production), use a very wasteful, indirect energy conversion process to turn heat into mechanical energy turning turbines for electric power. In the process, they spew sulfur pollutants into the air, and dirty cities with ash and other waste.

By burning the coal at a higher temperature, about 3000 degrees Celsius, adding a potassium "seed" to help ionize the coal gas, and passing this *plasma* through a magnetic field, electricity can be produced directly, without steam or turbines. Without using one moving part, electrodes in the channel carrying the gas can carry current out of the generator directly to trans-

Figure 2
Cost Comparison: Coal-Based MHD versus Existing Electric Generating Technologies
 (in millions of dollars)

	MHD	Conventional Coal	Oil	LWR*
Construction of a				
1-gigawatt Plant	300	430	390	560
Extraction of fuel	100	200	520	—
Refining	—	—	140	—
Stack clean-up	—	130	—	—
Fuel cycle	—	—	—	140
Transmission	170	170	170	170
TOTAL	570	930	1220	870
Electricity cost				
(cents per kilowatt)	1.5	2.3	3.1	2.1

* Light-Water Nuclear Reactors

mission lines. This direct conversion system, MHD, can be combined with a steam bottoming cycle to use what hot gas remains in a conventional steam cycle, to *double* the amount of electrical energy converted from a unit of coal as compared to current technology.

The potassium seed, in addition to increasing the ionization rate of the gas, chemically bonds with any sulfur in the coal, eliminating the need for costly and antiproduktive "scrubbers" and other pollution-control devices. The economic effects of increased conversion efficiency and pollution-free generation can be seen from *Figure 2*.

The technology required to make MHD based on coal fuel commercially feasible must also be developed for MHD electricity conversion based on advanced fusion fuel cycles. These would produce an ionized gas, or plasma, at much higher temperatures. Particularly, the materials problems in having near absolute zero temperature superconducting magnets in close proximity to super-hot gases must be solved for fossil-based MHD now, as a stepping stone for the similar fusion-related problems up the road.

The Schlesinger Department of Energy research and development program, which hopes coal-based MHD will not be commercial until near the year 2000 — with funding based on that perspective — must be replaced with a funding commitment commensurate with commercialization in the next 10 years. American industrial interests have already tried to bypass the ridiculous Department of Energy timetable by appealing to the Soviets, who will have a commercial demonstration plant by the early 1980s, to "transfer" this technology to U.S. companies. These companies recognize that only a high-technology coal program will provide them with energy they can afford.

U.S. industry and labor should be up in arms over the conscious sabotage of this crucial technology. They should demand that the government take up a serious MHD development program in cooperation with the Soviets, both for its implications for the fusion effort, and the obvious advantage it holds for all electricity consumers. Private deals will not substitute for a serious national MHD program.

Steel Production — Kicking and Screaming

The coal industry's second most important market will remain the steel sector. If a serious capital investment policy is not adopted to modernize and expand steel production, this sector will not exist in any significant degree beyond this decade. Although a \$50 billion investment program has been outlined in the U.S. Labor Party program, "Steel's Only Chance for Survival," the reaction of top steel manufacturers, such as U.S. Steel, is "We are in business to make profits, not to make steel."

Regardless of this attitude expressed by top U.S. Steel executives, the industry will have to be rebuilt, even if the manufacturers *have to be made* to implement such a program; the export of hundreds of nuclear plants in the next decade depends on it, as does the modernization of basic supporting industry such as machine tools. We are just now entering the nuclear age in terms of energy production, but are still dependent on the steel age for industrial and consumer production. The steel industry must be made conscious of its role in the transition to a fusion-based economy, even if they are dragged to that realization kicking and screaming.

One of the major reasons steel companies have been unable to keep their heads above water in basic replacement and modernization of plant and equipment has been the demand by the environmentalists and the Environmental Protection Administration to meet pollution control requirements by using the "best available technology." At the same time that steel companies are shutting down "marginal" facilities, cutting back production and laying off thousands of workers, they are frittering away *billions* of dollars per year to try to meet prohibitive and generally incompetent Environmental Protection Agency standards. Despite this counter-productive expenditure, less than half of the industry met compliance guidelines at the July 1977 deadline.

The Jordan Process

As in the coal mining situation, increasing productivity to become competitive with foreign steel, meet meaningful pollution standards, and bring economic health back to the industry can only be accomplished by the introduction of the most advanced technology. Otherwise, by simply "making profits" in the purely monetarist sense, U.S. steel is digging its own grave.

In some cases, even improvements in basic extant steelmaking technology can have a dramatic effect. The substitution of a blast of pure oxygen for the air now used in the blast furnace, a method worked out by engineer Robert Jordan, would increase overall combustion by raising the burning temperature. This produces a top gas richer in carbon monoxide rather than wasteful carbon dioxide, which can be used as a chemical feedstock for methanol. Methanol and the nitrogen from the air separation plant producing the pure oxygen for the original furnace blast can be spun off for fertilizer production.

Rather than venting carbon dioxide waste into the air and worrying about a "greenhouse effect" concentration of that gas, the "wastes" are converted into raw materials for additional industrial processes. In more advanced designs, if the source of heat energy is nuclear, carbon dioxide can even be recycled as a coolant for the reactor.

In terms of steel-making itself, the Jordan process *doubles* the iron throughput of the furnace as the higher blast temperature reduces the time needed for processing. To ensure that the steel industry produces what is necessary for the development of the rest of the economy, the crucial requirement is the pressure to produce from real on-the-book orders, resulting from a vigorous nuclear export program, and the political pressure of the rest of industry and the labor movement to force steel producers to recognize the criminality of current protectionist, antiproduction outlooks.

Renovating the Railroads

The most immediate problem that will result from increased coal production will be transportation. In its attempts to pit the coal industry against the nuclear industry, the Carter Administration has played on the paranoia of the near-bankrupt national railroads to prevent a rationally coordinated transport policy from being formulated. Without such a policy, doubling coal production would be an academic exercise.

The railroads have fallen prey to a perspective of increasing the quantity but not the productive quality of rail service, while fighting tooth and nail against the "intrusion" of additional transport technologies that will be required to haul an additional 600 million tons of coal.

The nation's railroads currently transport approximately 60 percent of all coal produced, and will have to continue to handle that proportion of coal production. They are proposing to do this primarily by adding thousands of hopper cars over the next 10 years, running into the hundreds of millions of dollars. This linear approach completely sidesteps the fact that the average railroad car is in motion *less than 1 percent per year*, the most scandalous record of any railroad system in the industrial world.

With relatively minimal investment in computer technology, the scheduling and allocation of existing hopper cars could actually handle the doubling of coal production — if the rail system were in that way considered a *national transport grid*.

In addition, according to General Accounting Office estimates, about \$5.2 billion will be needed by 1980 for railroad rehabilitation, with about half of the investment in the west. This does *not* include the absolutely necessary \$4.9 billion for the 10-year upgrading of the Conrail system in the eastern and midwestern United States. Many sections of older track and roadbed must be rebuilt, and vast expansion of the western lines is needed. The use of unit trains of 100 cars semipermanently coupled to deliver coal to a specific customer over a long time period, will also greatly increase rail productivity.

There are areas, particularly in the mountainous west, where the construction of new rail lines will either be physically impossible or at least uneconomical. High-technology construction and engineering companies have proposed the construction of coal slurry pipelines in these western areas, to transport pulverized coal in a water slurry. The water for dry areas could be recycled through return pipelines.

Unfortunately, the railroads have embarked on a major campaign to try to prevent pipeline companies from securing eminent domain rights in such areas, and

have generally shrieked that development of such a technology would replace and bankrupt the railroads. Only if the government takes the responsibility of formulating a transport policy which utilizes the most efficient technology for varied transport needs will the railroads be able to see that a new, additional technology does not necessarily mean death-dealing competition, but a rational national grid to best meet coal transport demands.

A Matter of Necessity

It is clear by this point that a coal development program, as part of a transition into the fusion age, will run into the many billions of dollars. The U.S. Labor Party analysis of "How to Spend \$100 Billion on Energy" outlines a low-cost, high-technology national energy program that will require approximately \$33 billion for coal electricity development, and an additional \$6 billion for industrial and other uses. This is based on using high

technology in coal mining, in transport, and in steel and electrical consumption of coal. As is clear from that analysis, only a high-technology fossil fuel program, combined with developing fission and fusion development programs, will generate the needed capital to bring commercial fusion online.

The coal industry, the United Mine Workers, electrical utilities, industrial energy-consumers, and every citizen have a very immediate stake in what shape the national policy for fossil fuel development will take. Congress has already been inundated with coal conversion, environmental, and other destructive legislation. Some has already been passed, through a combination of conscious sabotage and wilful ignorance.

The technical basis exists for a coal-for-development component in a national energy plan. Only a fight on that overall basis will produce an energy program — not one that we can "live with," but one that future generations will flourish under.

NSC Aids Mine Strike Violence

The National Security Council has ordered the Federal Bureau of Investigation and the U.S. Treasury Department's Bureau of Alcohol, Tobacco, and Firearms (ATF) to so narrow their investigation of violence associated with the current miner's strike as to virtually prevent detection of the networks responsible, authoritative intelligence sources have disclosed.

The NSC has specifically ordered the FBI and the ATF to confine their inquiries to the strictest provisions of the Anti-Riot Act (popularly known as the Rap Brown Law), the sources say. And no other intelligence or law enforcement agencies are being allowed to participate in the investigation into the violence, and instead are being told to "keep out."

While the NSC's interference assures continued protection of the perpetrators of the violence, and their controllers centered in the Washington D.C. Institute for Policy Studies, Administration insiders close to Vice-President Walter Mondale are reportedly counseling Carter not to intervene in the strike itself, playing on Carter's fears that his intervention would cost him the support of organized labor.

Although both Indiana and Kentucky state police officials claim that the violence is being carried out

by "local boys," it is a well-known fact that brainwasher Eric Trist of London's Tavistock Institute has worked for years to develop networks of violence-prone anarchists within the miner's union.

For the last week, blizzard conditions in Appalachia and the Midwest have cut down the potential for violent confrontations between nonunion miners and instigated "roving bands" of strikers. As soon as the roads are passable again, police authorities expect to once again see convoys of strikers deploying out of West Virginia and Kentucky to shut down nonunion mines. Just prior to the snows, the heavily armed convoys had produced minor and major incidents of violence in four states, several of which were given prominent coverage in the *New York Times*, *Washington Post*, and similar journals. While such press accounts are in general exaggerated, informed sources report that the convoy deployment represents the maximum potential for violent incidents per se; the relatively minor violence is intended to become a credible cover for planned acts of sabotage to be carried out on orders from energy czar Schlesinger, these sources report.